

U.S. Application No. 10/538,860
Attorney Docket No. 2003B133C US
Response to OA of June 28, 2006
Response Dated September 27, 2006

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REMARKS

Reconsideration of the above identified application in view of the remarks following is respectfully requested.

Claims 1-83 and 87-95 are in pending in this case.

This invention is directed toward halogenated isobutyl copolymers having a new and unique comonomer sequence distribution. In applicants' efforts to improve the polymerization process of isobutylene polymers it was discovered that if the polymerization were to be performed employing hydrofluorocarbon as diluent, not only was the polymerization process unexpectedly improved, but the polymers obtained had a unique comonomer sequence distribution over the prior art polymers. This unique sequence distribution is reflected in the value "m".

Claims 1-83 and 87-95 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. The Office Action indicates in (2)(a) that "given the manner in which the specification has stated the value of m is determined, it is not understood how the value of m can be determined for an individual copolymer." Applicant respectfully disagrees.

The formula $F = m A / (1 + mA)^2$ can be reorganized into a simple Quadratic Equation in regarding to "m". Both "A" and "F" are readily measured on any given polymer sample. Having determined A and F, m is readily solved for because it is well known that any Quadratic Equation with one variable has mathematical solutions. For individual polymer, the solution of the Quadratic Equation is also the "best fit" of the equation. Example 152 listed in the table 26 demonstrated this point. However, for multiply polymers, it is well known to an ordinary skill person that the experimental data varies within allowable error-range related to the measurement technique. The individual "m" can be obtained by solving the same equation. The Table below, which is essentially identical to Table 26 in the application shows that Mol% Isoprene is experimentally determined and F is experimentally determined. "A" is the molar ratio of Isoprene to

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Isobutylene. Mol % Isoprene is measured. Mol% Isobutylene is determined by subtracting mol% Isoprene from 100. Thus $A = \text{mol\% Isoprene} / (100 - \text{mol\% Isoprene})$. Note, for example, that Ex. 152 shows 2.4 mol% Isoprene. Thus $A = (2.4 / 100 - 2.4)$ which equals 0.025 which is the number reported in Table 26. Note that in this table each m is designated for each particular run. The undersigned will readily provide this Table via a 1.132 affidavit should the Office Action so desire. Likewise, the polymers produced in Example 149 with 2.55 mol% Isoprene has an Mw less than 1,000,000. A 1.132 Affidavit to that effect can be submitted if the Examiner so desires.

Ex.	Diluent	Mol% Isoprene	A*	%:BI	F*	m
149	CH ₃ Cl	2.55	0.026	4.99	0.0499	2.1
		5.61	0.059	7.41	0.0741	1.5
		9.16	0.101	10.9	0.109	1.4
		12.7	0.145	13.3	0.133	1.3
150	CH ₂ FCF ₃	3.32	0.034	4.01	0.0401	1.3
		6.98	0.075	7.88	0.0788	1.3
		10.83	0.122	11.3	0.113	1.2
		15.5	0.183	14.0	0.140	1.1
151	CH ₃ CHF ₂	1.92	0.020	4.67	0.0467	2.6
		3.16	0.033	6.18	0.0618	2.2
		4.16	0.043	8.46	0.0846	2.4
		7.09	0.076	12.4	0.124	2.2
		8.88	0.098	14.9	0.149	2.3
152	CH ₂ F ₂	2.4	0.025	4.3	0.043	1.9

$A^* = (\text{mol\% Isoprene} / \text{mol\% isobutylene} = \text{mol\% isoprene} / (100 - \text{mol\% isoprene}))$

$F^* = \text{Triad fraction.}$

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In the case of individual polymer, the "best fit" method yields the exact same "m" by solving the equation because the mathematical solution of the equation is the "best" fit of the equation. In the case of multiply data points, the "best fit" method of determining "m" is consistent with the solution method of determining "m" because applicants were in good faith to determine "m" by best fitting multiple data points measured experimentally.

Applicants therefore respectfully submit that both "best fit" method and the "solution" method are consistent with each other. Withdrawal of the rejection is respectfully requested.

In response the rejection raised in (2)(b) of the Office Action, applicants respectfully submit that a person skilled in the art would recognize that the term "best fit" means "the least square best fit". The Figure 4 of the application clearly demonstrated that the best fit method used in the application is the well recognized "least square best fit." The Office Action correctly pointed out that the formula is a quadratic function which is necessary non-linear. However, applicants respectfully submit that the "best fit" is not indefinite because the "best fit" has to be within the range of the experimental error no matter how many data points were used in determination of the m value by using the "best fit" method.

The spread of values were clearly disclosed and visible in the Figure 4 of the application as filed and the individual m value can be easily calculated without any difficulty for a person of ordinary skill. Applicants disclosed both the F and A (easily converted from mol%) in Table 26. Applicants in good faith to determine the "m" value by best fit the formula with multiply experimental data points within the allowable experimental error. Applicants therefore respectfully submit that the claims are NOT indefinite.

The Office Action in (2)(c) also suggests that the claims are indefinite because the manner in which "A" is defined in the claims. It is respectfully submitted that when there are only two different kinds of monomers in the polymerization process, that the mol %

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and mole ratio are easily to be converted from one to another, i.e., the molar ratio = mol% Isoprene/(100 - mol% Isoprene), and hence it is clear to the ordinary practitioner that there is no inconsistency regarding the manner in which "A" is recited in the claims and in the specification. Applicants respectfully submit that molar ratio was used for determining "m" value even though mol% was used in Table 26 and Figure 4 because the mol % and mole ratio are easily to be converted from one to another. A 1.132 Affidavit to that effect can be submitted if the Examiner so desires.

Withdrawal of the rejection is respectfully requested.

In view of the above amendments and remarks it is respectfully submitted that the claims in this case are in condition for allowance. Prompt notice of allowance is respectfully solicited.

Respectfully submitted,

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